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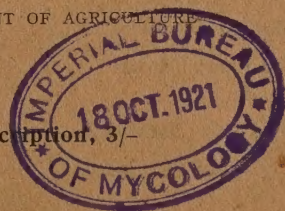
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## EDITORIAL NOTES—APRIL, 1920.

Enquiries have been received from time to time as to the cost of machinery for the purpose of preparing coconut oil on a commercial scale. Specifications have recently been received from London of machinery for the equipment of a small modern oil mill, and the information is published elsewhere in this issue as it will be of general interest. Some notes are attached which will enable a comparison to be made of the value of copra and the oil obtained from it and the cost of shipment to the market. An important point that must not be overlooked and which is entirely in favour of the oil is that after copra has been prepared, unless the moisture content is reduced to the point below which moulds do not readily grow, it is liable to deteriorate on keeping and usually arrives at the market containing a varying percentage of free fatty acids, the presence of which considerably reduces the value of the copra, whereas the oil, when once pressed out of the copra, which would be used immediately it has been prepared and therefore when it contains the minimum quantity of free fatty acids, does not further change on keeping. One drawback of course is that the packages for the oil are a source of expense. There is no doubt that casks could be made from some local timber, but at first it might be better to utilise barrels constructed locally from imported parts, or other imported packages.

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A list of exports of the produce of the Colony is published elsewhere in this number; while sugar shows little improvement on last year, which was not unexpected, and bananas show a very serious falling off, due principally to the interference in shipping due to strikes in Australia, the amount of copra exported has increased considerably over the amount for the previous year, which itself up to then was the maximum quantity exported in one year. Rubber shows a satisfactory increase, which however is not entirely due to the natural increase in the production of the plantations since considerable stocks had to be held pending an improvement in the market price and in shipping facilities. Of the minor products, Trocas shell shows a satisfactory increase particularly in the value, and maize shows a satisfactory increase.

The quantity of hides exported remains much the same as for previous years.

The total value of the produce of the Colony shows an increase of approximately  $12\frac{1}{2}$  per cent. on the value for the previous year.

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The Government is trying to arrange for the importation, by the direct steamer from India, of seed of the following kinds:—Bajra, Chena (two kinds of millet), Sarson (mustard), Mattar (pea), and Mung (dhal); and anyone

who is interested in the cultivation of these products, or who knows of small settlers in his neighbourhood who may wish to try one or more of them, is requested to communicate early with the Agricultural Department.

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In connection with the treatment prescribed under regulations made under the Diseases of Plants Ordinance for plants attacked by diseases declared under those regulations, it may be pointed out that any treatment which has the same effect may be used. Thus for killing scale, some excellent proprietary preparations are found to be effective in other countries, and would doubtless have the same effect on scale insects here. It would not be possible, nor is it desirable, to prescribe all of these preparations. Those which have been selected are standard washes, which can be prepared if necessary by the user himself from materials in common use for domestic or plantation purposes. Should anyone wish to test other methods, there is nothing to prevent him, and if such methods are successful in clearing the cultivation, the latter, being no longer attacked by the declared pest, is not subject to the prescribed treatment.

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In a letter dated 4th February, 1920, referring to a shipment of Sea Island cotton sent to England at the end of last year, the General Manager of the British Cotton Growing Association writes:—"The Egyptian market is exceedingly strong, over six shillings per pound being paid for Egyptian cotton, and I have no reason to doubt that similar prices, if not better, should be obtainable for your Sea Island cotton. With the high prices at present ruling, and with the possibility of much higher prices in the future than in the past, I should hope that the growing of cotton would become a profitable industry for your small settlers. Of course it is not anticipated that the prices obtained to-day will always be procurable, but I think you may take it as being fairly safe that the average price in the future will be practically double that of pre-war."

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A LIST OF FIJIAN PLANT NAMES.

*Errata and Addenda.*

By C. HAROLD WRIGHT, M.A., Government Chemist.

*Errata.*

The following misprints occurred in *A List of Fijian Plant Names* published as Bulletin No. 9 by this Department. With the exception of the first two these errors were kindly pointed out to the author by Mr. A. W. Hill, M.A., Assistant Director of the Royal Botanic Gardens, Kew, and Dr. H. B. Guppy, F.R.S.:—

Before masi ni tabua (plant name) insert ai.

For Rawa (plant name) read Rauva.

Sub Boloa	..	..	for	<i>Courthovia</i>	read	<i>Couthovia</i> .
„ Bore ni wai	..	..	„	<i>Lendenia</i>	„	<i>Lindenia</i> .
„ Bua	..	..	„	<i>Fragraea</i>	„	<i>Fagraea</i> .
„ Cago	..	..	„	<i>Cucuma</i>	„	<i>Curcuma</i> .
„ Dalo	..	..	„	<i>Colosasia</i>	„	<i>Colocasias</i> .
„ Damanu	..	}	„	<i>Callophyllum</i>	„	<i>Calophyllum</i> .
„ Damanu dilodilo	..		„	<i>Callophyllum</i>	„	<i>Calophyllum</i> .
„ Driti	..	..	„	<i>candatus</i>	„	<i>caudatus</i> .
„ Kovekove	..	..	„	<i>stringulosa</i>	„	<i>strigulosa</i> .
„ Makosoi	..	..	„	<i>Canaga</i>	„	<i>Cananga</i> .
„ Matiavi	..	}	„	<i>Wikstraemia</i>	„	<i>Wikstroemia</i> .
„ Sinu mataiavi	..		„	<i>Wikstraemia</i>	„	<i>Wikstroemia</i> .
„ Uvitao	..	}	„	<i>Colysaccion</i>	„	<i>Calysaccion</i> .
„ Vetao	..		„	<i>Colysaccion</i>	„	<i>Calysaccion</i> .
„ Vere	..	}	„	<i>Columbrina</i>	„	<i>Colubrina</i> .
„ Vusolevu	..		„	<i>Columbrina</i>	„	<i>Colubrina</i> .

Sir David Prain, F.R.S., Director of the Royal Botanic Gardens, Kew, informed me that Kawai, the yam with spiny roots, is *Dioscorea esculenta* and not *D. aculeata* as given by Dr. Seemann. In Bulletin No. 9, Kaile, the wild yam, is given as *Dioscorea sativa*. In this case the author relied on Dr. Seemann (see *Flora Vitiensis*, p. 307), but he was doubtful about it at the time because John Horne (*A Year in Fiji*, p. 86) gives the botanical name of Kaile as *Dioscorea bulbifera*. From information about the species of *Dioscorea* kindly given to me by Mr. I. J. Burkill, M.A., Director of Gardens, Singapore, it is now clear that Horne's identification is correct, and that Kaile is *D. bulbifera* and not *D. sativa*.

*Addenda.*

Many of the following plant names were inadvertently omitted when the list of Fijian plant names in Bulletin No. 9 was compiled. Bulei and Sama are given by Dr. H. B. Guppy (*Observations of a Naturalist in the Pacific*, Vol. II, p. 548), and were unfortunately overlooked before. The rest of the plant names have been collected by the author since Bulletin No. 9 was published. Last year the author went through the herbarium specimens of orchids from Fiji at Kew, most of which were sent by Sir Everard im Thurn. Amongst these were specimens of the orchids known as Tu-vuna from Colo-i-Suva marked with their native names in Sir Everard's handwriting; also two other orchids which I recognised as those known as Vavara

and Vavara-sa. These orchids were identified at Kew (three of them being new species), and I am thus able to give their botanical names:

Ba ni dakai (Nadroga) .. ..	= Wiriwiri.
Beluve .. ..	Bird's nest fern ( <i>Asplenium nidus</i> ).
Boresi (Nadroga) .. ..	= Boreti.
Bulei .. ..	<i>Alstonia plumosa</i> .
Danidani .. ..	<i>Zingiber zerumbet</i> .
De ni me (Macuata) .. ..	} <i>Sida retusa</i> (v. Cavucidra).
De ni vuaka .. ..	
Draudreka .. ..	<i>Pandanus</i> , sp.
Dovidovitaqala (Colo North) ..	= Beluve.
Harau (Nadroga) .. ..	= Kawai.
Hina (Nadroga) .. ..	= Gasau.
Kauti .. ..	= Senitoa.
Lagakali .. ..	<i>Aglaia edulis</i> .
Maqele (Nadroga) .. ..	= Wiriwiri.
Qaro (Nadroga) .. ..	= Nokonoko.
Qereqere (Nadroga) .. ..	= Lauci.
Rogolali .. ..	Four O'clock ( <i>Mirabilis Jalapa</i> ).
Sama .. ..	<i>Commersonia echinata</i> .
Suguvaua (Colo North & Bua)	= Botebtekoro.
Togo (Nadroga) .. ..	= Dogo and Tiri.
Toto (Nadroga) .. ..	= Lauci.
Tu-vuna .. ..	<i>Pseuderia coronaria</i> and <i>P. vitiensis</i> .
Vavara .. ..	<i>Geodorum vitiense</i> .
Vavara-sa .. ..	<i>Phaius Blumei</i> .
Vico .. ..	<i>Saccharum floridulum</i> .
Vitua (Nadroga) .. ..	Yam (v. Uvi).
Wiriwiri (Nadroga) .. ..	= Mulomulo.
Yakoto (Nadroga) .. ..	= Vasili.

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## REPORT ON AN INVESTIGATION OF MATTERS AFFECTING STOCK IN COLO NORTH, FEBRUARY-MARCH, 1920.

By WAKEFIELD RAINEY, Government Veterinary Officer.

1. The investigation occupied the period from 17th February to 19th March, 1920 inclusive; the itinerary of the work is given as an appendix to this report. At least 80 per cent. of the stock were examined and as much as possible of the grazing land in the province was inspected.

### CENSUS OF STOCK.

2. My estimate of the approximate numbers of stock in Colo North is as follows:—Cattle, 7,000; horses, 1,000; sheep, 700. About 25 per cent. of the total cattle are cows. A large proportion is made up of working oxen; this explains the small proportion of the cows.

### LANDS AND GRAZING.

3. Soon after entering the province from Colo East one observes that the grazing is poorer. The rich Para flats come to an end soon after leaving Waisomo; after Nubumakita, the first important halt in Colo North, the grazing is clearly of inferior quality. The land, however, right through the mountain districts is so lightly stocked that the animals upon it maintain at least fair condition.

Approaching Nubumakita from the south one emerges from the forest or bush upon an expanse of open country. Few stock are seen and there is a considerable growth of such grasses as Thurston, Fiji paspalum, a kind of spear grass, and also sedge. This sedge is very prevalent between Nubumakita and Nasogo and apparently is spreading. There is no more open country on the overland mail route until the Nadala valley is entered. Here the prevailing grasses are Fiji paspalum, and the above-mentioned spear grass. The latter, whose proper name I do not know, is prevalent throughout Colo North and is easily distinguished by its narrow lance-like light-green blades growing in close parallels, and by its flowering head of five branches given off in a bunch at the end of the stem, with a sixth odd branch given off half an inch or more lower down the stem. In the Nadala valley, as elsewhere on light lands in Colo North, there is also found a grass I am accustomed to term (for lack of better information) "Feathery hill-grass." It resembles somewhat the tall oat-grass of Europe or a very straggling loosely built fescue. Here and there is seen a patch of the scented lemon grass. None of these is a good forage grass; few cattle will fatten on pasture composed solely of this herbage. Nevertheless the grazing is quite suitable for the production and maintenance of store cattle, sheep, ponies, and mules, provided it is not overstocked.

In places one finds a thick and more or less extensive growth of a small trefoil which appears to grow too close to the ground to afford grazing for the cattle; it is appreciated by horses and would be excellent for sheep. In the Lewa valley there is much paspalum, said to have been planted by Mr. V. Mune. Thurston grass prevails under the trees in small openings in the bush and along the bush tracks. No *Clidemia hirta* is seen in Colo North after leaving Nasogo. The most prevalent "weeds" are two shrubs, one termed "soft burr" and the other "rat-tail curse." The latter is



most prevalent in the Nadala valley. It gets its name from a peculiarity of the flower-bearing stem which tapers off at the end like the tail of a rat and is quite bare of blossoms or foliage for the last few inches. The deciduous blossoms are of a bluish-purple colour. It is said that "soft burr" is best controlled by two following annual burnings of the pasture; possibly the same means would help to clear the Nadala valley of the "rat-tail curse." Descending into the coast area from Nadarivatu one finds among the foothills, and uplands generally, pasture similar to that in the Nadala valley, except that there is much more "seed grass," and that one often meets with considerable local variations in the nature of the herbage.

On Yagara for instance, and in the Tagitagi and Vatia Point areas, one finds much trefoil and seed grass, and very little Fiji *paspalum* or other of the lighter grasses. Extending from Tavua along the coast and inland for a few miles one observes in many places the spread of a grass which appears to be a sort of *panicum*. My attention was drawn to the distribution of this grass by Mr. E. D. Francis of Yoladro, who has observed it for some years and considers it to be the best forage grass in the district, an opinion which I endorse—the careful and sagacious observations of Mr. Francis in local matters affecting stock were of great assistance to me and without his guidance it would not have been possible for me to see so much of the stock and the country in so short a time. The sides of the road from Tavua to Ba are covered with a sward of this *panicum* grass. Its flowers resemble those of *paspalum* except that they are much smaller and that the seeds are borne in a single, instead of a multiple, row. The blade of the leaf is short and broad and of a rich green colour with a sheath-like attachment to the stem from which it springs laterally. It seems to be a hardier and better pasture grass than *paspalum*, able to grow and form a permanent sward in all sorts of soil. Very little Para grass is seen in Colo North, partly no doubt on account of the relatively dry climate, and partly because the cane planters treat it as a noxious weed.

A good deal of Guinea grass is seen bordering the cane-fields at Tavua, put in by the planters to provide feed for their working animals when there is a shortage of cane-tops. The latter, chopped up and mixed with crushed maize and molasses, forms the standard ration in the Tavua area. The Guinea grass grows to a great height in the rich alluvial soil.

All the best land in the coast areas is appropriated for the cultivation of sugar cane or grain crops; only the light uplands are available for grazing purposes. I do not think that any of this pasture whether in the mountains or on the coast will carry stock at a better rate than one beast to seven acres or one sheep to two acres. Except on the Government owned land and the Fiji native holdings in the mountains, the grazing is stocked to its full capacity with cattle and horses; in some places to more than its full capacity. There is a serious danger of over stocking with horses unless means are found to control the present reckless multiplication of these animals.

It should be remembered that a horse requires twice as much grazing as an ox, and that it can only pay to feed good horses. Mule-breeding would prove a salutary check, but I shall refer to this later. A better use could be made of most of the pasture in Colo North if sheep farming became more general. By the judicious use of cattle and burning to keep down the rough herbage and weeds, a large area of excellent grazing could be found for sheep. Sensitive grass is scarce in Colo North, and it is said that where it occurs in this district cattle will not eat it. I observed clumps of sensitive grass apparently untouched in an overstocked paddock on one estate.



CATTLE AND BREEDING.

4. Where lands are not overstocked the cattle were found in good store condition; occasionally fat animals were seen. Taken as a whole, however, the province is not suitable for the production of fat cattle. Excellent stores can be produced, but at present this class of cattle is rapidly falling off as the result of overstocking, inbreeding, and breeding from immature stock. The disastrous results of these errors could have no better illustration than that afforded by the present generation of Hereford cattle in Colo North. Local opinion is that Hereford cattle degenerate more speedily and completely than any other breed in this part of Fiji; whether this is so or not it is evident that the degeneration of the Hereford breed in Colo North is very much more complete than that of the Shorthorn.

One sees in this province very few bullocks of distinct Hereford origin well enough developed for working purposes; at least 80 per cent. of the working oxen are clearly from Shorthorn strains. The chief reason for this extraordinary falling off of the Hereford breed is probably an extraordinary extent of inbreeding and under-feeding of growing stock, but local opinion may be to some extent correct in deciding that the Shorthorn is to be preferred to the Hereford in Colo North. Apart from the question of distinct breeds, a point that calls for serious consideration is the absolute shortage of mature bulls.

Leaving out the wild animals on Vatia Point and a small adjacent area, of which I could obtain no exact information, my notes show that there are barely twenty mature bulls in the province, and that of these only about six have any pretensions to breeding and full development. Among herds amounting altogether to nearly 1,000 animals, owned by Indians around Tavua, there appeared to be only one mature bull. Most of the cows are fertilised by bull-calves of between nine and eighteen months, often of wretched physique and in no instance sufficiently developed to produce good-class offspring. This circumstance appears to be due to some or all of the following reasons:—

- (1) There is a brisk demand for working oxen in Tavua North, so that so soon as a young bull shows signs of bulk and strength he is castrated and trained to the yoke.
- (2) The market value of a trained working ox in Colo North is at present higher than that of a bull not so trained.
- (3) Most of the cattle owners are Indian small-holders of whom many work from time to time on plantations. While working on plantations they are allowed grazing for a limited number of cows, calves, and working bullocks; the privilege could hardly be extended to include bulls.
- (4) Among small holdings where much of the land is cultivated in small plots, the care of an adult bull requires time and attention to prevent it from straying and involving its owner in difficulties with his neighbours.
- (5) The subjective evidence of the Indians themselves is that they have been used in the past to rely upon the loan of bulls which appear formerly to have been in the possession of the Colonial Sugar Refining Company and certain planters at Tavua. Although these bulls no longer exist there has not been time for the development among the Indians of the policy of keeping bulls for themselves.

With the Indian, as with most other small-holders, it is only the immediate gain or advantage which appeals. He is concerned only to get his cow in calf in the cheapest and easiest way and such a means as exists in the yearling bull, that has not yet developed those masterful qualities which require labour and skill in his control and management, nor is ready to be trained as a working ox. Whatever the reason may be, the fact of a shortage of mature bulls in Colo North is indisputable.

The only remedy that I can suggest is the provincial ownership of suitable stud animals under the control of the District Commissioner assisted by a permanent committee of three planters. The bulls, which should be good stud animals of an approved breed, would be allotted at the rate of one bull to 300 cattle in areas occupied by Fijians or Indian small-holders. Presumably it would be necessary for the Government to allot the money for the purchase of the bulls in the first instance; the province should be able to undertake the subsequent maintenance and replacements, by a system of stud charges, either directly or in the form of a levy on all cattle owners in the district at so much per head of all cattle.

The constitution of the committee of the planters will be referred to again in the section of this report dealing with the Stock Improvement Ordinance.

The expense and trouble of this scheme are admitted, but there appears to be no other way of maintaining a fair standard of cattle in districts chiefly occupied by Indians and Fijians.

#### SHEEP.

5. Sheep were seen only on Wainivoce, the estate farmed by Messrs. Foulis and Marsh. Here a flock of about 700 is run. The breed is a cross between the Romney and Merino. The sheep are shorn in October, and they averaged at the last clipping over six pounds of wool each. The shearing is done by Fijians, who often become experts at the work. When looked after properly and not overstocked, the sheep have not been liable to disease of any kind. This fact entirely disposes of the supposition that Fiji generally is unsuitable for sheep; on the other hand I am satisfied from the evidence of Wainivoce that, on this side of Fiji, sheep farming is not unduly difficult and is more profitable than cattle farming alone. Among the sheep at Wainivoce one may have the novel experience of seeing grass growing on a sheep's head. The "seed grass" seeds become deposited in the wool on the sheep's head between Christmas and March. The seeds rapidly germinate in the Summer rains and the green grass-shoots drop out of the wool in April. At this time of year (March), the heads of the sheep appear as if "raddled" with green paint.

#### HORSES.

6. A prominent ambition in young stock-owning communities is to breed active heavy horses of "Vanner" type. The means taken as a rule are to mate the light mare of the country with a Clydesdale or Shire stallion in the hope and confidence that in spite of all adverse conditions there will be produced an animal having all the best points of both parents. It does not matter to the optimistic breeder that the result is usually contrary to his hopes; he continues to try. It is cheaper in the long run to begin breeding with males and females of the desired type, that is to say to breed from an established strain of the sort of animal you want. If a heavy type of horse is sought that shall unite in itself the qualities of bulk and activity, there is established and ready-to-hand the Percheron.



If a draught animal is required that shall be essentially a stout worker yet capable of production from light mares, there is to be had for the breeding by means of suitable jack-asses—the mule. The virtues of the mule as a draught animal have been consistently over-looked by the British agriculturist and colonist. The statistics of the late war reveal that the economic wastage per cent. among army mules by shipping losses, by mortality and disability from sickness, and by hardship, was considerably less than half that among horses, and that the ordinary working mule may be maintained in reasonable condition on half the ration required to maintain similarly the heavy draught horse. The working life of the mule, other things being relatively equal, is about twice that of the horse.

From the evidence at my disposal I am inclined to regard as a complete failure the effort to establish a suitable breed of heavy horses in Fiji by means of any cross with the existing light mares, and to advise that the breed be improved by continuing to introduce fresh thoroughbred blood, and that for draught purposes mules be bred by crossing 60 per cent. to 80 per cent. of the mares with imported jack-asses. If horses continue to multiply on small-holdings in Fiji at their present rate they will soon become a pest; mule breeding would control this. If the breeder is determined to breed heavy horses in Fiji let him import Percheron stallions and Percheron mares, confine his operations to the province of Ra, and feed the young stock liberally. He should certainly desist from an attempt which the experience of breeders under similar conditions in the other countries has shown to be hopeless; that is to say from trying to produce on poor land, by crossing Clydesdale stallions with weedy mares, a type of draught animal that shall be as useful as a mule while possessing the additional attraction of being able to reproduce its kind.

With the help of the police it was found possible to secure large musters of stallions in Colo North; altogether nearly 100 were inspected, and all but a few were put down for castration. The Indian does not care to castrate, and the Fijian will not take the trouble, consequently the country-bred colt is allowed in nearly every case to remain entire.

In my opinion the mountains and upland part of the province is suitable only to maintain ponies; there is not the food for large horses.

In the coast areas, fairly good horses of the thoroughbred type can be bred and maintained, provided fresh thoroughbred blood is introduced from time to time. My views are opposed to the views of those who favour the introduction of hackney or trotter blood, since it appears to me that these types are superior in no respect, for purposes required of horses in Fiji, to the thoroughbred, while on the other hand they are inferior in many respects. I think that merit is often required by the hackney in introducing "fresh blood," simply because it is "fresh blood"; mating with a freshly imported thoroughbred stallion would give just as much "fresh blood" and as a rule far better results. I agree that it is better to cross a mare with a fresh hackney stallion than to go on inbreeding with a worn out thoroughbred strain, but further than this my experience of light-horse breeding will not allow me to go.

#### DISEASE.

7. There is very little disease among stock in Colo North. Not more than six cases of tuberculosis were positively diagnosed among the thousands of cattle inspected, and although it must be assumed that some cases in the early stages of the disease could not be detected and consequently were passed over, nevertheless the incidence of tuberculosis among adult cattle

in the province may be estimated at less than one per cent. This is extraordinarily low. The relatively low rainfall, the more bracing atmosphere, the necessarily large area per head of stock, the open nature of the country, and the longer hours of clear sunshine, all contribute to hinder the spread of tuberculosis in the province. The only other disability of any importance ascertained to exist among the cattle is the condition termed variously "Brand Cancer," "Cancer," "Fiji disease," &c. This condition takes the form of chronic granulating sores on the back or on the mucous membrane of the eye. These sores are locally regarded as malignant and specifically contagious, but it may certainly be stated that they are neither. Taking the back first, the pathology or causation appears to be as follows:—

Under the continual influence of tropical sun and rain, the skin on the back of certain thin-skinned cattle (usually cows) of pure European origin becomes seriously devitalised, just as the skin over the shin-bone of a poorly nourished human being may become devitalised. If while the skin is thus so to speak at the height of devitalisation during the summer months there occurs an injury (such as a blow, the belated effect of a too deep brand, or an abrasion of any kind) a sore is formed with ulcerating edges over which the weak half dead skin has not tendency to grow. Then the flies get busy and irritate the wound by alternately feeding and excreting upon it. Nature asserts herself in default of skin-healing, by throwing out from centre of the sore a quantity of protective granulation tissues or proud flesh, so that the sore assumes the appearance of a tumour or projecting growth. In due course there is suppuration from the surface of the growth and the resultant pus is carried by gravitation, by subcutaneous lymphatics, or by the tail, to other devitalised areas of the skin, thus (by the eroding action of the pus or by the formation of subcutaneous abscesses or by the infection of abrasions, leading to the formation of fresh sores. So the vicious circle is established, and so is given the semblance of a malignant tumour of multiple growth, where in fact there is only the benign effect of a combination of simple causes. If before the condition is too far advanced the following action is taken, a complete cure may confidently be expected:—

- (1) With a sharp knife or razor cut off the growths level with the skin.
- (2) Subsequently dress the wounds morning and evening with the following liniment: camphor, one part; creasote, one part; turpentine, four parts; coconut oil or neats-foot oil, ten parts. Mix the liniment well before use and apply with a feather. Do not put the feather into the bottle, but into a saucer or other receptacle into which a little of the liniment is poured. Shake thoroughly before pouring it from the bottle. When making the liniment dissolve the camphor in the turpentine before adding the oil.

The eye trouble is of a similar nature except that the chief exciting cause may be the entrance into the eye of grass seeds. The treatment is to remove the growth as far as possible with scissors, and to treat by washing the affected area daily with a two per cent. solution of sulphate of zinc or a one per cent. solution of silver nitrate, followed by placing between the eyelids a small piece of yellow oxide of mercury ointment. This ointment should be diluted by mixing thoroughly with it six parts of pure white vaseline or lanoline. If the eye growth is advanced so that the entire eye is disorganised it is not amenable to amateur treatment, and the animal had better be killed for meat. Eye cases must be taken early. I am often asked whether the flesh and milk from animals having these "summer sores" are suitable for food. The flesh is certainly wholesome; as regards



the milk it should be remembered that the sores are usually suppurating and that the whisking tail may convey pus from the sore to the milk pail, either directly, or indirectly by contamination of the udder. If this is prevented by washing the udder before milking, and by securing the tail during milking there can be no objection to the use of the milk for food.

In the tropics, excessively granulating or indolently healing sores are found in many sites affecting animals and man; there is nothing cancerous or malignant about them, and it is well to disabuse the mind of an idea which to my knowledge has led to the unnecessary destruction of great numbers of useful animals.

Filariasis in dogs exacts its toll in Colo North as well as elsewhere in Fiji. In another article I have pointed out that the so-called "worm disease" may be prevented by keeping the dog shut up at night in a mosquito proof kennel. Where this may not be practicable I would suggest that the same effect (that the preventing the biting of mosquitoes) may to some extent be secured by dipping the hand in kerosene oil and rubbing it off in the dog's hair every evening. If the coat of the dog is saturated with kerosene, poisoning might follow, but a considerable degree of "oiling" is possible without endangering the dog and the operation will do much to prevent inoculation of the animal by mosquitoes. Creasoted or carbolised oil would have a similar effect, but the chances of poisoning would be greater.

Any badly affected dog should be destroyed. Such an animal is a veritable reservoir of the disease; a drop of blood from his arteries will infect a mosquito so heavily that the insect's subsequent bite is bound to convey the parasite to other dogs. Apart from the danger to other dogs it is excessively unpleasant to reflect that mosquitoes infected by biting diseased dogs are constantly introducing into our own blood circulation the embryos of the filaria immitis; the extent of this invasion is only proportionate to the degree in which the dogs in the vicinity are diseased.

It is true that hitherto this inoculation has not been followed by positive consequences, but who can say with certainty that in the course of evolution an inoculation may not at some time prove positive for some unfortunate human being?

It is clearly our duty for these reasons alone to destroy without delay all dogs obviously and severely affected with the filaria immitis, and it is a false estimate of humanitarianism to suppose that instantaneous death without fore-knowledge is not vastly to be preferred to the lingering and distressing dissolution which is the present lot of most dogs in Fiji.

#### THE STOCK IMPROVEMENT ORDINANCE 1909.

8. It will be concluded from that section of my report dealing with cattle that it would be impracticable and indeed absurd to attempt at present to apply the provisions of the Ordinance to bulls in Colo North. First catch your bulls.

As regards stallions, however, the matter is very different, and there is no doubt that the application of the Ordinance to these animals will prove of great benefit. I ordered the castration under the Ordinance of over 70 stallions in Colo North, and every one of these will be a good riddance. Apart from the bad effect on the breed, their existence as entires is a positive nuisance and public danger.

It is quite clear to me, however, from the experience gained in this province and Colo East that the provisions of the Stock Improvement Ordinance

cannot be properly carried out by a central authority at Suva, but that the scheme must be decentralised and administered on the spot in the province concerned.

It would take many weeks yearly in each province for the Government Veterinary Officer to administer the Stock Improvement Ordinance properly even if he had no other work to do; it is impossible at present in the time at his disposal to follow up cases requiring police action.

Since then it is desirable to carry out the Ordinance at least as regards stallions and later on as regards bulls, as well as to set up machinery to deal with other matters affecting stock, it becomes urgently necessary to consider what the machinery should be.

In my opinion the appointment of a whole time or part time professional Stock Inspector for these purposes in each province or district of a province would either be very costly, or would not secure the universal control and certain continuity of office which are essential. Many other objections will present themselves on consideration, but to save time my alternative proposal may here be stated:—

It is briefly that the District Commissioner be appointed Stock Inspector for the province or district administered by him. Upon being appointed Stock Inspector the District Commissioner would invite the planters in his district to elect from among the European community a committee of three to advise him in matters affecting stock, and to undertake severally or conjointly such local executive duties as Sub-Inspectors of Stock as may be necessary. The licence or, as I prefer to call it, registration book, would be kept by the District Commissioner and licences would be issued and fees collected by him as Stock Inspector in accordance with the recommendations of the committee. Any appeal from the recommendation of the committee would be made to the District Commissioner as Stock Inspector, who would as a matter of course refer the appeal for decision to the Government Veterinary Officer. As far as possible the committee should include members from remote parts of the district so that a good watch may be kept on stock throughout the country with a minimum amount of travelling.

The sum of £25 might be included in the estimates to cover any expenses of administration of the Stock Improvement Ordinance in a district; to be expended at the discretion of the District Commissioner.

In addition to administering the Stock Improvement Ordinance, the committee would no doubt become the representative body of the district in all matters affecting stock; and if the principle of provincially owned bulls be ultimately adopted, the committee might undertake the business involved in the disposal and management of the stud-animals.

At the annual inspection of the Government Veterinary Officer, the committee would give him full information of all their actions and proposals.

I think that the principal benefits which would be secured by such an arrangement are:—

- (1) Continuity of office.
- (2) Efficiency and universality of control in legal and police respects.
- (3) Economy.
- (4) Sympathetic co-ordination in necessary veterinary measures.

It might be thought advisable to vary my proposals in some other way; for instance the District Commissioner might be ex-officio a member



of the Stock Inspection Committee which would then become a committee of four, any two of which would form a quorum. Perhaps this would be a better plan and perhaps other improvements might be suggested; so long as the principle of decentralisation with certain automatic continuity of official control vested in local high authority is accepted, one may easily agree to any modification in detail. Pending the adoption of this, or any other scheme, the arrangements made by me in Colo North and East are as follow:—

- (1) A complete list of stallions to be castrated with full particulars has been handed to the District Commissioner concerned with the request that he will cause the necessary police action to be taken under the Stock Improvement Ordinance of 1909.
- (2) This police action includes the proper warning to the owners of stallions to have their animals castrated by a given date, or in default the issue of a summons to attend a trial of the case before a magistrate.
- (3) In addition to other penalties the Court would arrange for the animal to be castrated at the owner's cost.
- (4) The names and addresses of residents willing to castrate animals on payment of the regulation fees have been made known to the District Commissioners.

Thus it rests with the authority existing within the district to secure the full effect of my work in this respect.

#### TRADE.

9. Until recently the Colonial Sugar Refining Company's butcherries at Lautoka received so-called fat cattle from Yaqara at the remarkable price of 22s. 6d. a hundred pounds. This arrangement is now terminated. A considerable number of good store cattle are sold at reasonable prices to buyers at Penang. Not long ago the majority of the store cattle at Yaqara were sold in one lot to a Suva buyer. Apart from these transactions it was not possible to discover any considerable trade in cattle other than small sales of working oxen and cows within the province.

There appears to be no butchery in Colo North; fresh meat for Nadarivatu and Tavua comes from the Colonial Sugar Refining Company's butchery at Ba. It is said that the Fijians in Colo North have not the available cash to make it worth while to open a butchery however small at Tavua, but in the absence of practical trial one may be allowed a little doubt on this point. There is a good market for the sale of sheep to the Indians for slaughter.

Apart from the valley of Nadala and Lewa, the sheep growing prospects generally, and the abundant room for improvement in quality, I do not see much opportunity at present for expansion of the cattle trade in Colo North. In point of numbers of stock the coast areas and foot-hills are already carrying in the aggregate as many cattle as they can comfortably feed in the present unimproved state of the land. There is a steady demand for working bullocks and good milk cows for home consumption at from £6 to £10 each, and to meet this demand an improvement in the quality rather than an increase in the quantity of cattle is required.

The valleys of Nadala and Lewa properly fenced would carry at least 1,000 cattle where few or more are grazed at present. Better still they would carry 500 cattle and 2,000 sheep. It is estimated that during the past six

months more than 2,000 cattle have passed through Tavua *en route* to the Rewa district *via* either Nadarivatu or Penang. Colo North and other districts in transit are affected as concerns their roads and grazing grounds as well as by the likelihood that at some time or other confusion, either accidental or intentional, may arise between the identity of the travelling cattle and animals the property of persons on the trade routes. To obviate this risk it is suggested that any person intending to travel cattle overland from one district to another should be compelled to obtain from the police a way-bill setting forth his name, address, number, and description of cattle, their place or origin, and their destination. This way-bill would be checked and countersigned at each police station *en route*. Such a procedure is enforced in Australian States, and I am of opinion that it should be introduced into Fiji not only to safeguard owners of stock, but to provide means of knowing what movements of cattle are taking place.

It would be well for the Fiji Government (unless the papers are already in their possession) to obtain from New Zealand, Queensland, and New South Wales administrations, copies of their stock way-bills together with copies of the regulations affecting the overland transit of stock in order that, with these publications as a guide, there may be drawn up what is requisite for Fiji.

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## DERRIS AS AN INSECTICIDE.

The properties of several species of Derris have recently been investigated by three officials of the Department of Agriculture, United States of America, and the value as an insecticide ascertained.

Of the species of Derris used in the investigation, one species (*Derris uliginosa*, Benth) was sent from Fiji, where it is indigenous and is known by the native name of *Duva*. Its poisonous properties are well known to the natives and are utilised by them for the purpose of stupefying fish.

In the article describing the investigation (*Journal of Agricultural Research*, Washington, D.C., 1919, Vol. XVII, No. 5) and the results, the following summary of the conclusions is given:—

*Derris*, known widely as a powerful East Indian fish poison, was found to fulfill several of the requirements of a general insecticide; it acts both as a contact insecticide and as a stomach poison, but is of no particular value as a fumigant. Six species of *Derris* were tested, but only two of them (*elliptica* and *uliginosa*) were found to be satisfactory for insecticidal purposes.

According to the views of various authors, the toxic principle in *Derris* is a resin, which affects the various classes of animals according to the development of their nervous system. It kills some insects easily and others with difficulty, but it usually acts slowly and seems to kill by motor paralysis.

Denatured alcohol was found to be a good economic solvent for extracting the toxic principle, which when applied in spray mixtures proved to be efficient against aphides, potato-beetle larvæ, and small fall webworms. For proprietary insecticides it is possible to incorporate the extracts from *Derris* into soft soaps which, when greatly diluted with water, are ready for use.

*Derris* powder, used as a dust under practical conditions, was found to be efficient against dog fleas, chicken lice, house flies, three species of aphides (*Aphis rumicis* L, *A. pomi*, De Geer; and *Myzus persicae*, Sulz), potato-beetle larvæ and small fall webworms, but of no practical value against bed-bugs, roaches, chicken mites, mealy bugs, *Orthesia insignis*, red spiders or against the crawling young of the oyster-shell scale. Used as a powder in water with or without soap under practical conditions, it proved to be efficient against most of the aphids sprayed and also against cabbage worms (*Antographa brassicae*, Riley), the larvæ of apple datanas (*Datana ministra*, Dru.), oak worms (*Anisota senatoria*, S and A) small tent caterpillars and potato-beetle larvæ.

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## MACHINERY FOR A MILL FOR COCONUT OIL.

By C. H. KNOWLES.

The following specifications and prices have recently been received from firms in England for machinery and equipment for a mill for preparing coconut oil from copra. The prices quoted are subject to the usual condition as to labour being obtainable and at the same rate as that at the time the prices were fixed, and they include packing and delivery on board steamer at certain English ports :—

## PLANT NO. 1.

	Weight. tons.	Measurement. cubic feet.	Price.
Power Plant—Steam Engine & Boilers..	37½	2,700	£2,901
Oil Extracting Plant—Capacity, 1 ton of copra per hour pressed twice	201	6,465	12,539
			£15,440

## PLANT NO. 2.

Power Plant—Steam Engine & Boilers..	35½	2,320	£2,100
Oil Extracting Plant—Capacity, 16 cwt. of copra per hour pressed twice	83	3,550	8,939
			£11,039

## DESCRIPTION OF PLANT NO. 1.

The power plant comprises one horizontal engine, cylinder 14½ in. diameter by 30 in. stroke; two 24 N.H.P. tubular boilers and one vertical feed-water heater.

The oil-extracting apparatus consists of:—

One set breaking rolls for first break.

One set breaking rolls, finer, for second break.

One steel heating kettle.

Two hydraulic presses, rams 16 in. diameter, for pressure of 2 tons to sq. in., for the preliminary pressing, with cages 19 in. diameter by 100 in. long; the necessary elevators, distributing valves, pressure gauges, and an oil receiving and settling tank with oil pumps.

For the second pressing the following is provided:—

One cake breaker and triturator with three pairs rollers.

One set crushing rolls.

One heating kettle.

One hydraulic moulding machine.

Three hydraulic presses.

The necessary gauges, distributing valves, elevators, one oil-receiving tank and one cake-paring machine.

The hydraulic plant comprises one set hydraulic pumps for high and low pressure, one set low and high pressure accumulators\*, the necessary piping, shafting, brackets, &c.

The building required to accommodate the plant would be a single storey of 80 ft. by 45 ft. floor space, with a separate boiler room 40 ft. by 40 ft.

\* The weights for the accumulators are not included, they would be constructed on the spot of scrap iron, &c.



DESCRIPTION OF PLANT No. 2.

The power plant consists of one tandem compound horizontal steam engine, 175 B.H.P., cylinders, 13 in. and  $21\frac{1}{2}$  in. diameter by 30 in. stroke, one horizontal multitubular boiler, 23 ft. 7 in. long by 6 ft. diameter, with injector, donkey feed pump and extension of fire grate for wood fuel.

The oil-extracting machinery comprises:—

For first pressing:—

One copra disintegrator.

One set rolls.

One set hydraulic press, of two presses each with its own kettle.

The necessary pressure gauges, distribution valves, foundation tanks, oil pump and cistern.

For the second pressing:—

One cake breaker.

One set rolls.

One kettle.

One hydraulic moulding machine.

Four hydraulic presses, with foundation tanks, oil pump, pressure gauges.

One cake-paring machine.

One set edge stones.

The necessary elevators, &c.

The hydraulic gear consists of one set of pumps, one set of accumulators, and the necessary distribution valves, the necessary piping, and gearing.

A supply of press mats, hydraulic leathers, and other needful sundries is included.

The building to accommodate this plant should have one storey of 100 feet by 105 feet floor space.

The complete detailed specifications of these plants may be seen by arrangement with the Superintendent of Agriculture.

The following notes are given to facilitate a comparison of the value of copra with that of coconut oil.

Fair average Fiji copra contains 63 per cent. of oil and 6 per cent. moisture. Modern machinery such as that referred to above should enable such a proportion of the oil to be extracted as would leave 5 per cent. in the cake, which means that slightly over 61 per cent. of the copra would be obtained as oil.

One gallon of coconut oil weighs  $9\frac{1}{4}$  lb, and therefore one ton of oil would occupy 242 gallons.

One ton of copra would give 1,366.4 lb or 147.7 gallons of coconut oil.

The oil would require to be shipped in casks, tanks or other suitable containers or in bulk. A cask containing about 40 gallons occupies 14 cubic feet of shipping space, hence in such casks the oil from one ton of copra would require 3.69 casks occupying 51.7 cubic feet. These might be made from local timber or made up locally from imported shooks. The cost is taken as £1 each. It might be difficult to arrange the shipment of oil in bulk for small quantities, but of course this is likely to be the cheapest arrangement.

Square tanks pack well and no shipping space is lost as is the case with barrels. Tanks, 3 ft. each way, would occupy 27 cubic feet and would hold, say,  $26\frac{1}{2}$  cubic feet of oil, weighing 13.68 cwt., or including the tank 16 cwt., and therefore well within the weight for ordinary cargo. Each tank would hold rather more than the oil from 1 ton of copra, which oil, in such tanks, would occupy, including the proportion of tanks, 24.1 cubic feet.

Before the war the common 400-gallon tank cost about £5, but they are not likely to go back to that price; and for the smaller tank, in black iron £8 is taken as the cost in quantity. They would last several trips, four being taken as the life of one tank, hence  $26\frac{1}{2}$  cubic feet of oil would be subject to a charge of £2 for the package. In some cases returned empties are carried at a reduced rate, empty beer barrels between Suva and Auckland for instance being allowed a rebate of  $46\frac{3}{4}$  per cent, of the freight on the return journey. It is not perhaps likely that a reduced freight would be possible for empties between Fiji and say Europe, in which case the tanks should be constructed so that they could be knocked down, or partly knocked down, and so reduce the return freight. It should be possible by this means to bring about a reduction in the freight on the return of  $46\frac{3}{4}$  per cent., hence the return freight is taken as  $53\frac{1}{4}$  per cent. of the outward freight.

Copra is shipped in bulk, but requires bags from the plantation to the ship, lasting, say, three trips and costing, say, 8s per ton of copra shipped. Copra is subject to a loss from the time it leaves the plantation until it arrives at the foreign market of up to 3 per cent. For the purpose of this calculation 1 per cent. is taken as the average loss.

The following information as to the values of copra and coconut oil was received from the United States Food Administration in December last:—

Value of copra and coconut oil, Pacific Coast, November, 1919:—

Copra .. .. .	from $8\frac{1}{2}$ — $9\frac{1}{2}$ cents per lb.
Coconut Oil .. .. .	„ $15\frac{1}{2}$ —19 „
Coconut Oil, deodorized, refined .. .. .	„ 19— $21\frac{1}{2}$ „
Coconut Oil, edible .. .. .	„ 21—22 „

The London market prices on 1st November, 1919, were quoted as below:—

Copra from £55 15s. to £58 5s. per ton.

Coconut oil, crude, from £94 to £101 per ton.

The values used below are 9 cents for copra and 17 cents for coconut oil.

#### *Copra.*

One ton @ 9 cents .. .. .	£42 0 0
Less bags .. .. .	£0 8 0
Loss, 1 per cent. .. .. .	0 8 5
Freight .. .. .	10 0 0
	<hr/>
	10 16 5

Nett value .. .. . £31 8 7

#### *Copra as Coconut Oil and Cake.*

1366.4 lb oil @ 17 cents .. .. .	£48 7 10
873.6 lb cake @ £5 per ton .. .. .	1 19 0
	<hr/>
	50 6 10



Less either (1)—

Barrels, 3.69 @ £1 .. ..	£3 13 10	....
Freight, 51.7 cubic feet @ £10 ..	12 18 6	....

16 12 4

Or (2)—

Tanks, proportion of cost for 24.1 c. ft.	1 15 8	....
Freight, 24.1 c. ft. @ £10 and 53½ per cent. for return .. ..	9 4 8	....

11 0 4

Nett value in barrels .. ..	£33 14 6
Nett value in tanks .. ..	39 6 6

The balance is therefore £2 10s. 11d. per ton of copra in favour of the oil when shipped in barrels, and £8 2s. 11d. when shipped in tanks. From this must be deducted the interest on the cost of the mill and the working expenses.

The machinery specified above is capable of dealing with at least 20 tons per day working continuously for No. 1 plant and 16 tons for No. 2, or at 280 working days a year, 5,600 tons for the year for No. 1 and 4,480 for tons No. 2.

The total cost of the mill in the case of No. 1 is likely to be in the neighbourhood of £25,000 and £18,000 for No. 2. A charge of £2 per ton on the copra crushed would provide £11,200 in the case of No. 1 and £8,960 in No. 2, which would give 10 per cent. interest, &c., on the cost of the mill in each case and leave £8,700 for working expenses for the year for No. 1 plant, and £7,160 for No. 2.

The actual working expenses are difficult to estimate with any accuracy, but the following is suggested tentatively:—

<i>Per annum.</i>	<i>No. 1.</i>	<i>No. 2.</i>
Supervision .. ..	£800	£800
Coal, 2 tons 12 cwt. per day @ £3	2,548	....
„ 2 tons 5 cwt. per day ..	....	2,205
Labour .. ..	560	560
Oil, spares, &c. .. ..	560	560
	£4,408	£3,125

## THE PRINCIPAL EXPORTS, THE PRODUCE OF THE COLONY, FOR THE LAST FIVE YEARS.

Description.	1919.		1918.		1917.		1916.		1915.	
	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.	Quantity.	Value.
Sugar (tons).....	64,348	£ 1,014,241	63,010	£ 918,018	97,335	£ 1,485,041	120,528	£ 1,729,658	85,563	£ 1,065,464
Copra (tons) .....	27,311	674,215	19,318	469,332	15,368	359,372	13,489	255,913	15,238	233,959
Bananas (cases) .....	235,204	76,563	313,036	132,877	413,301	169,718	417,065	205,122	294,208	120,741
Bananas (bunches) ...	142,378		438,449		529,452		817,499		446,824	
Rubber (lb) .....	155,219	13,867	81,215	8,156	85,295	11,804	59,071	8,833	28,609	3,464
Maize (bushels) .....	9,832	1,841	1,510	256	665	91	21,546	3,207	18,775	2,690
Sisal Hemp (tons) ....	6½	300	4	179	17	465	5½	163	....	....
Cotton (cwt.) .....	....	....	....	....	11	64	....	....	....	....
Wool (tons) .....	1½	140	1	108	1½	155	2½	273	12	1,180
Hides (number).....	5,387	5,194	4,837	4,780	4,743	4,328	2,952	2,779	4,011	2,282
Trocas Shell (tons)....	417	20,764	247	8,564	481	16,488	742	25,470	892	27,438
Total Value of Exports, the Produce of Colony	£1,822,037		£1,623,228		£2,067,858		£2,251,570		£1,473,108	



## EXTRACTS FROM REPORTS OF INSPECTORS.

COCONUT SCALE (*Aspidiotus* species).

Mr. M. A. Forsyth reports that on Ovalau all towns with the exception of Bureta and the cultivations of one or two adjoining are practically clean, and no trouble is experienced in dealing with isolated trees that become infected. The cultivations however that are not clean are still very badly infested and need constant work. The re-erection of houses blown down during the recent storm has interrupted the progress of the work, and special attention is being given by the Inspector to this part of the island. The good results which were noticeable at Wakaya after the storm were not apparent here, but a number of plants showing dead scale have been observed, which the Inspector thinks may be due to the extremely hot weather lately experienced. Of the badly-attacked European plantations near here, one shows a great improvement though a few trees show re-infection and the other one shows signs also of recovery.

At Moturiki a lot of work is required, and here, as at Bureta, the re-building of houses has caused delay. A lot of dead scale is apparent, which Mr. Forsyth attributes to the hot and dry weather rather than to the effects of the storm which dealt very lightly with the coconuts on this island.

Material from Gau, Koro and Batiki which has been inspected shows no signs of scale.

At Wakaya work is progressing satisfactorily. Many badly-infested trees have been destroyed and leaf cutting has been extensive. The pest is more extensive than was at first apparent, but is nothing like so prevalent as at Moturiki.

The presence of the scale on bush trees is a considerable trouble and arrangements are being made for experiments upon the artificial control of the pest on the trees near cultivations to prevent, or to minimise, re-infection of the plants in the latter.

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NOOGOORA BURR AND BANANA SCALE.

No inspection has been possible during the month in connection with these pests, since no officers were available.

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INSPECTION OF FRUIT.

The Inspector of Produce reports that the s.s. "Levuka" took 23,679 bunches and 9,475 cases of bananas on 23rd March. The fruit offered for shipment was on the full side. Two men were detailed to each lighter and they were instructed to reject all fruit appearing to be maturing. Altogether 1,475 cases and 2,147 bunches, equal to 12 per cent. of the shipment were rejected, all for maturity. The cool air delivery showed a temperature of 26 °F. The ship, having been overhauled in Sydney, was in a thoroughly clean condition. The handling and storage was very good and ample dunnage was provided. Live scale was somewhat prevalent on the fruit in the punts and six punts were rejected for re-fumigation. Three punts were in a leaky condition and the bottom tiers of fruit were therefore shipped separately. The fruit, on the whole, while being rather on the full side, was as good as can be expected at this time of the year.

[Information has since been received that the whole of this shipment of fruit arrived in a ripe condition and was a total loss.]

The shipment of fruit to New Zealand by s.s. "Navua" on 20th March amounted to 20,771 cases and 573 bunches, equal to 42,115 bunches. The fruit was cut too full for this time of the year, and 9,700 cases, equal to 23 per cent. of the shipment, were rejected. These cases, it may be remarked, were subsequently repacked, and owing to the large number to be dealt with, the steamer was delayed somewhat and a quantity of fruit had to be loaded on deck after dark uninspected. The fruit offered for this steamer showed far more ripe fruit than usual, rather suggesting that fallen fruit blown over in the recent storm, may have been included. The exceedingly hot and "steamy" weather experienced for sometime before the fruit was cut would of course conduce to early ripening. No live scale was found on the fruit in the punts. Black and weather-stained cases were much in evidence and, as the matter has been the subject of official complaint from New Zealand, it was particularly brought to the notice of shippers. The Fruit Inspector in Auckland was advised that the cases were all "new" but that owing to unavoidable circumstances the cases had been exposed to the weather. Some cases were badly nailed down, owing, it was explained, to the fact that the usual two-inch nails not being procurable in Fiji, shorter ones had to be substituted. The fruit was carefully handled and stowed, ample dunnage being provided, and the air-holes and spaces were satisfactory. The holds were clean.

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#### INSPECTION OF VESSELS.

The following list shows the number of vessels reporting during March, 1920, for inspection under the Coconut Scale Regulations and the number of cases in which material had to be destroyed:—

<i>Port.</i>	<i>No. of vessels inspected.</i>			<i>Cases in which material was destroyed.</i>		
Suva .. ..	..	..	6	....	—	
Levuka .. ..	..	..	64	....	28	
Lautoka .. ..	..	..	10	....	2	

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The master of a launch who left Ovalau and proceeded to Koro without having his vessel inspected was proceeded against before the District Commissioner, Levuka, and was convicted and fined £1.

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